UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

UNITED STATES OF AMERICA, Plaintiff, v. PHILIP MORRIS USA INC., f/k/a PHILIP MORRIS INC., et al., Defendants.	)	Civil Action No. 99-CV-02496 (GK) Next Scheduled Court Appearance: Trial (ongoing) **REDACTED FOR PUBLIC FILING**

WRITTEN DIRECT EXAMINATION

OF

PAUL SLOVIC, Ph.D.

SUBMITTED BY THE UNITED STATES PURSUANT TO ORDER #471

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Q: Please state your name, for the record.

A: Dr. Paul Slovic.

Q: Dr. Slovic, please describe your higher education.

A: I received a Bachelors Degree in Psychology from Stanford University in 1959. I obtained a Masters Degree in Psychology from the University of Michigan in 1962 and my Ph.D. in Psychology from the University of Michigan in 1964.

Q: What is your current position?

A: In 1986, I became the President of Decision Research and accepted an invitation to become a Professor of Psychology at the University of Oregon. I have served in these positions since that time.

Q: Have you provided the Court with a copy of your curriculum vitae?

A: Yes, it is U.S. Exhibit 78,541.

Q: What is Decision Research?

A: Decision Research is a nonprofit research institute, which I established with two colleagues in 1976, located in Eugene, Oregon and specializing in the study of human judgment, decision making, and risk assessment. The research conducted at the Institute is both theoretical and applied and is sponsored by U.S. government agencies such as the National Science Foundation, the National Cancer Institute, the National Institute of Aging, the Environmental Protection Agency, the Department of Energy, and the Forest Service, by private foundations (e.g. MacArthur, Sloan), and private companies (e.g., Pfizer).

Q: Please describe the type of research conducted by Decision Research.

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A: Decision Research is dedicated to helping individuals, industry, government, and society understand and cope with the complex and often risky decisions of modern life. Our research is based on the premise that the management and regulation of hazards must be guided by an understanding of how people think about risk and how they value the potential outcomes, good and bad, of their decisions.

Studies at Decision Research range from analysis of individual decisions, such as what motivates people to wear seatbelts or to value the natural environment, to social decisions, such as the choice among alternative energy sources or risk-regulation strategies. Other studies examine the social impacts of nuclear, chemical, and biological technologies, the origins of trust and distrust in risk management, and perceptions of the risks and benefits associated with preserving nature and developing new technologies.

Our continuing research studies at Decision Research, addressing questions about human judgment, information processing, and risk perception are linked to broader social questions such as:

- How should decisions about technologies and the management of natural resources be made in our society?
- What should be the role of experts in engineering, ecology, economics, risk assessment, and other disciplines as compared to the role of citizens?
- What role can education and communication play in helping people understand and cope with risk?

Q: In what areas do you conduct research?

A: Since 1959, I have been doing research on decision making and risk-taking behavior. My

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fields of specializations are judgment, decision making, risk perception, and risk assessment. I was one of the first social scientists to study people's perceptions of risk and I have written numerous articles and books based on my research in this area. I have been researching the psychology of judgment, decision making, and risk for more than forty years. I have conducted research on risk perception associated with smoking since about 1990. My research has closely examined the degree to which young people and adults understand the risks associated with smoking. In contrast to the popular view that "everybody knows the risks," I find serious gaps in understanding and appreciation of the significant risks of smoking, which I shall describe in my testimony.

Q: Please tell the Court about your position as a professor at the University of Oregon.

A: After becoming a professor at the University of Oregon, I taught courses on judgment and decision making and led seminars on issues involving risk and society. However, over time, I gravitated back to the research with which I have been involved at Decision Research. As a professor, I am still a research advisor for individual students, but I no longer teach classes. I devote the majority of my time to the research I conduct at Decision Research.

Q: Are you a member of any professional societies?

A: Yes.

Q: What are they?

A: I am a member of the American Psychological Association and a Fellow in Divisions 3, 8, 21, and 34 of that Association. I am a member of and Charter Fellow in the American Psychological Society. I am also a member and Fellow of the American Association for

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the Advancement of Science; a member, as well as the past president, of the Society for Risk Analysis, a member of the Judgment and Decision Making Society; and a member of the National Council on Radiation Protection and Measurements. I am also a member of two honorary societies, Sigma Xi and Phi Kappa Phi.

Q: Have you received any academic or professional honors and awards?

A: Yes. I received a National Science Foundation Graduate Fellowship in 1961-62. I was a Fulbright Scholar from 1973-74. I received the Clifford D. Spangler Award, Alpha Kappa Psi Foundation, American Risk and Insurance Association, for the Outstanding Article on Risk and Insurance during the period 1977-1987. I was awarded the Distinguished Contribution Award from the Society for Risk Analysis in 1991 and the Distinguished Scientific Contribution Award from the American Psychological Association in 1993. I received an Honorary Doctorate from Stockholm School of Economics in 1996 and I have been invited to receive another Honorary Doctorate (Doctor of Science) from the University of East Anglia in 2005. In 2001, I was asked by the Nobel Committee to give a keynote address in Stockholm at a symposium celebrating the 100th Anniversary of the awarding of the Nobel Prizes. In 2002, I was designated a lifetime associate of the United States National Academies of Science and Engineering and the Institute of Medicine as recognition of my service on committees of these organizations.

Q: What was your first position after receiving your Ph.D.?

A: I initially started working at the Oregon Research Institute (ORI) in Eugene, Oregon, as a Research Associate. I worked at ORI from 1964 until 1976, when ORI disbanded,

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conducting theoretical and applied studies of judgment and decision making including decisions regarding risk. These studies provided insight into the ways that individuals weight and combine different sources of information when making a judgment or decision.

Q: Have you published articles in the area of risk perception?

A: Yes. I have published, either individually or with co-authors, more than 200 articles in the area of risk perception. The majority of these articles are in peer reviewed journals.

Q: Have you published books that relate to risk perception?

A: Yes. I have co-authored or edited eight books. All of these books relate to risk and risk perception.

Q: Have you testified as an expert in risk perception in any smoking and health related cases?

A: Yes. I provided expert deposition testimony in several cases. I provided trial testimony in Bullock v. Philip Morris, in which I was qualified as an expert.

Q: Have you testified as an expert in any non-smoking and health related cases?

A: Yes, I have testified as an expert in risk perception in varying types of litigation. For the most part I have provided deposition testimony, although I did provide trial testimony in a case dealing with the potential location of a high pressure gas pipeline through a housing development in Las Vegas.

Q: Has your work on risk perception and decision making been relied upon by others in your field of research?

A: Yes. It is regularly cited by others in my field of research. In his recent Nobel prize

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address, Professor Daniel Kahneman commented on my research on affect, which I describe in greater detail below, by noting that, "The idea of an affect heuristic (Slovic et al., 2002) is probably the most important development in the study of judgment heuristics in the past few decades." Kahneman, D. (2003), "A perspective on judgment and choice: Mapping bounded rationality," *American Psychologist, 58*(9), 697-720.

Q: Do you have a sense of how often your work is cited?

A: According to Thompson/ISI listings, which maintains a database of more than 8,000 scholarly journals, I am one of the most highly cited authors in the social sciences. For example, my article, "The Perception of Risk" (*Science*, 1987), has been cited in almost 1,000 journal articles.

Q: Is your work on risk perception cited beyond the study of psychology?

A: Yes, although I am a psychologist, my research on risk perception is often cited by economists. As a result, I am listed in *Who's Who* in Economics (4th edition).

Q: What methodology do you employ to obtain information about human decision making as it relates to smoking behavior?

A: I obtain this information in several ways. From studying the scientific literature on decision making and on smoking, from controlled experiments my colleagues and I have conducted to illuminate basic psychological processes of judgment and decision making, and from survey questionnaires designed to provide insight about the factors underlying smoking behavior. I rely on surveys designed by others, as well as those I have conducted. In particular, I have helped design and analyze two large national surveys comparing smokers' and nonsmokers' answers to a variety of specific questions

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regarding smoking behavior. I have conducted:

First, a national telephone survey of more than 3500 individuals conducted on behalf of the Annenberg Public Policy Center of the University of Pennsylvania in the fall of 1999 and winter of 1999-2000 ("Annenberg Survey"). Households were selected through random-digit dialing, and within each household a resident aged 14 or older was selected randomly for the interview. Young people were over sampled. Completed interviews were obtained for 2,002 members of a "youth sample" ages 14 to 22 and 1,504 members of an adult sample ranging in age from 23 to 95. Within the youth sample there were 478 smokers and 1,524 nonsmokers; among the adults there were 310 smokers and 1,194 nonsmokers. Professor Dan Romer and Patrick Jamieson were collaborators on this survey.

Second, a national telephone survey of more than 700 individuals, consisting of 123 adult smokers, 205 adult nonsmokers, 193 adolescent smokers, and 205 adolescent nonsmokers, conducted between December 2000 and February 2001. In this survey, adolescents were defined as ranging from 15 to 19 years old. Professor Neil Weinstein, another expert witness in this case, was a collaborator on this survey.

Q: Why do you rely on survey information?

A: I use surveys because they elicit important perceptions and attitudes that can be compared between smokers and nonsmokers, young and old, and men and women, etc. Smokers' responses can be examined for differences linked to such variables as number of years the individual has been smoking, the number of cigarettes smoked per day, and attempts to quit smoking, for example. I believe that answers to carefully conducted surveys provide

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reliable information, useful in explaining and predicting smoking behavior.

Q: Describe generally the study of risk perception.

A: Scientists assess risks through experimentation, mathematical models, and statistics (risk as analysis), within numerous fields of study such as toxicology, epidemiology, and engineering safety analysis. While members of the public are aware of some of the findings of science, they rely heavily on fast, instinctive, and intuitive reactions to danger, characterized as "risk as feelings." My research has sought to understand the dynamic interplay in the human brain between risk as feelings and risk as analysis. Research that my colleagues and I have conducted describes the cognitive and motivational factors that cause perceptions of risk of laypeople to differ systematically and often dramatically from experts' evaluations of risk. With colleagues, I developed what has become known as "the psychometric paradigm" to show how characteristics such as knowledge, controllability, lethality, catastrophic potential, equity, dread, and perceived benefits shape both individual perceptions and societal responses to risk.

Q: Please explain the psychometric paradigm.

A: The psychometric paradigm is a method for identifying the important psychological characteristics that determine risk perceptions (e.g., controllability of the hazard, dread), obtaining judgments of these characteristics to quantify their importance for a particular hazard, and then describing the interrelationships among these characteristics.

A well-known result based on the psychometric paradigm is the risk-perception space shown in Figure A below: Some 81 hazards were rated on each of the 15 characteristics shown below the main figure. Through a technique known as "factor analysis," these 15

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characteristics were reduced to two main dimensions or factors titled “dread risk” and “unknown risk” as shown in the lower figure (e.g., dread risk includes uncontrollability, dread, catastrophe, etc.). Then each of the 81 hazards can be placed in this two-dimensional “perception space” according to how it was rated on the characteristics that make up each factor. The hazards that are highest in perceived risk and that appear to concern the public most are those in the upper-right quadrant (e.g., chemicals, nuclear reactor accidents), whose risks are judged as unknown and dreaded. Note that the risk of disease from smoking is characterized by the public as a known and not dreaded risk. It appears in the lower-left quadrant along with other hazards that the public is not particularly concerned about (e.g., skateboards, power mowers, snowmobiles, and trampolines).

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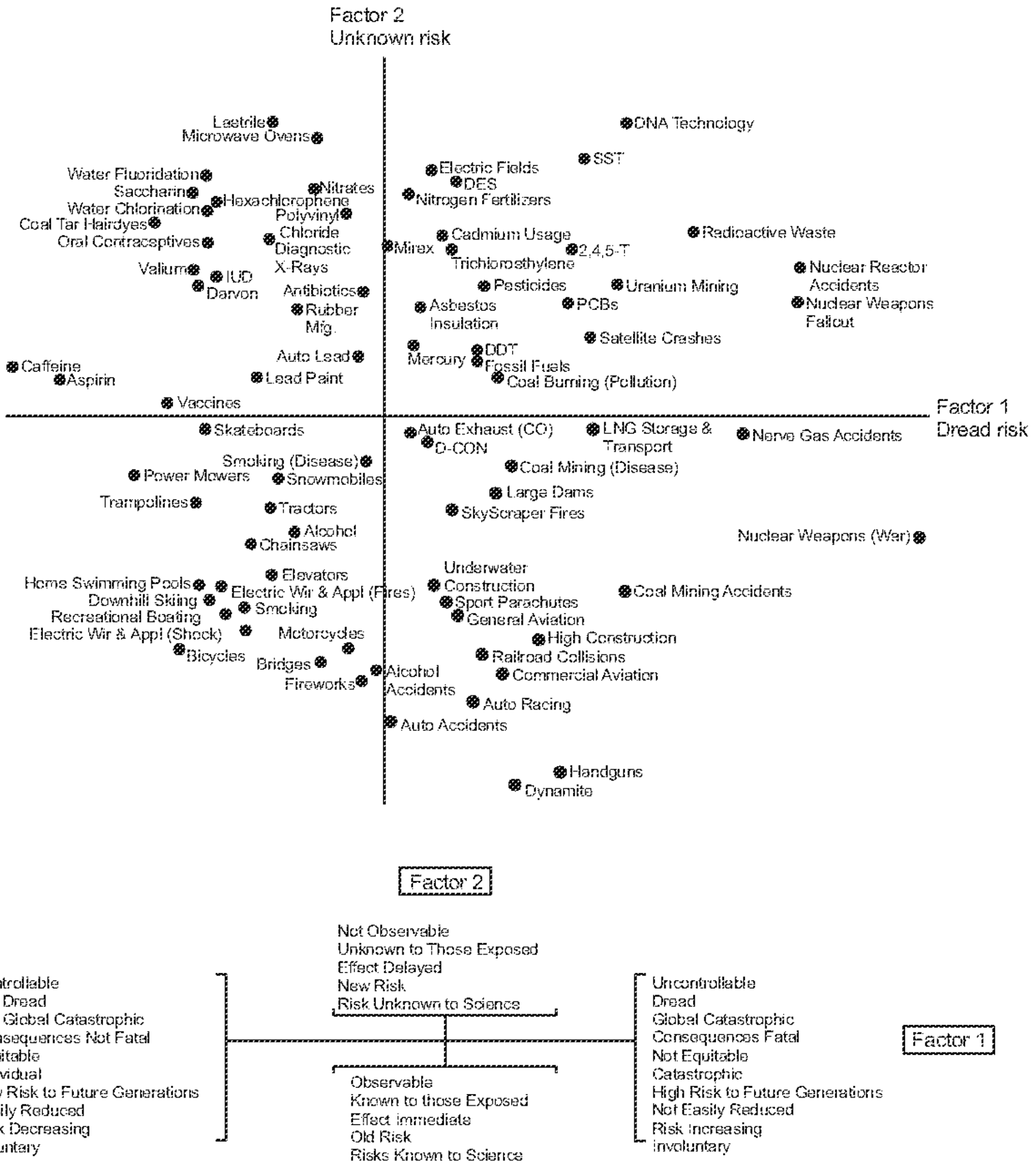

Figure A: Location of 81 hazards on factors 1 and 2 derived from the interrelationships among 15 risk characteristics. Each factor is made up of a combination of characteristics, as indicated by the lower diagram. Source: "Facts and fears: Understanding perceived risk," by Slovic, P., Fischhoff, B., and Lichtenstein, S. in R. C. Schwing and W. A.Albers, Jr. (Eds.), *Societal risk assessment: How safe is safe enough?* (pp. 181-214). New York: Plenum, 1980.

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Q: **There are two points for smoking in the lower-left quadrant. What is the distinction between the two?**

A: The point labeled smoking (disease) refers to the risk of disease associated with the act of smoking. The second point is the risk from smoking-caused fires, which was judged as similar to the fire risk associated with electrical wiring.

Q: **What work were you asked to perform in this case?**

A: In general terms, I was asked to explain whether individuals understand and appreciate the risks of smoking and to explain the decision making process employed by individuals in commencing and continuing to smoke. In addition, I was asked to look at whether the tobacco companies in this case employed methods to communicate a message to minimize the perceived risk associated with smoking, resulting in an increased likelihood that non-smokers would start smoking and current smokers would not quit.

Q: **Are you familiar with what Defendants in this case have maintained about the public's perception of risk associated with smoking?**

A: It is my understanding that the tobacco companies in this case maintain that both children and adults have long understood that smoking causes disease, and that they, in fact, over-estimate the risks associated with smoking.

Q: **Generally speaking, do individuals adequately understand and appreciate the risk of smoking?**

A: No, most people tend to have a deficient appreciation of the risks associated with smoking, especially when they begin to smoke. It is my conclusion that in starting to smoke, individuals do not consider the risk, but rather associate smoking with the

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prospect of pleasure, fun, excitement, and adventure. Most people tend to consider the risk associated with smoking only after they have become regular, addicted smokers. Even then, their understanding of the risks is incomplete.

Q: On what evidence do you base that conclusion?

A: My conclusion is based, in part, on data from the Annenberg survey I described earlier. Responses in that survey show that beginning smokers were being guided by what is known as the "experiential mode of thinking," relying on feelings rather than deliberate, analytic thinking (see Figure B below). Slovic, P., Finucane, M., Peters, E., & MacGregor, D.G., "The Affect Heuristic," In T. Gilovich, D. Griffin, & D. Kahneman (Eds.), *Intuitive Judgment: Heuristics and Biases,* New York: Cambridge University Press (2002); Slovic, P. (Ed.), *Smoking: Risk, Perception, and Policy*, Thousand Oaks, CA: Sage (2001) ("Slovic, 2001"), Chapter 6, citing Epstein, S., "Integration of the Cognitive and Psychodynamic Unconscious," *American Psychology*, 49, 704-724 (1994) ("Epstein, 1994"). Specifically, almost 80% of the adult smokers surveyed answered "not at all" when asked how much they thought about how smoking might affect their health when they first began to smoke (Question 19a). Young smokers appeared more likely to have thought about health when they began to smoke, but their most frequent answer was still "not at all." Since most smokers start smoking when they are young and this question required the smoker to answer based on their thinking at the time they started smoking, the distinction between the answers of the adult smokers and young smokers is not a distinction between young and adult thinking, but more so a difference between less recent and more recent thinking. However, now that they smoke, most of

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these individuals said that they do think about the health effects (Question 19c). A substantial proportion of smokers also said that, since they started smoking, they have heard of health risks they did not know about when they started (Question 19d).

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Figure B. **Perceptions and expectations of the beginning smoker (in percentages)**

Questions/responses	Adult smokers (N = 310)	Young smokers (N = 478)
Q19a. When you first started to smoke, how much did you think about how smoking might affect your health?		
A lot	5.8	13.8
A little	15.5	38.9
Not at all	78.4	46.9
Don't know/refused	0.3	0.4
Q19c. How much do you think about the health effects of smoking now?		
A lot	53.9	54.6
A little	32.9	36.0
Not at all	12.3	8.6
Don't know/refused	1.0	0.8
Q19d. Since you started smoking, have you heard of any health risks of smoking that you didn't know about when you started?		
Yes	54.8	33.5
No	43.9	66.3
Don't know/refused	1.3	0.2
Q19e. When you first started smoking, did you think more about how smoking would affect your future health or about how you were trying something new and exciting?		
Thought about future health	4.5	21.1
Thought about trying something new and exciting	67.4	58.0
Other	18.1	11.5
Don't know/refused	10.0	9.4
Q19f. When you first started smoking, how long did you think you would continue to smoke?		
A few days	3.9	9.4
A few months	4.5	6.5
Less than a year	3.2	7.7
1–5 years	4.8	10.2
More than 5 years	7.4	4.8
Didn't think about it	75.8	61.3
Don't know/refused	0.3	0.0

Source: Slovic, 2001, Chapter 6.

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Most telling are the answers to Questions 19e and 19f. Far more beginning smokers were thinking about "trying something new and exciting" than were thinking about health (19e). When asked how long they thought they would continue to smoke when they first started, the majority of young and older smokers said that they did not think about it (19f).

Q: How is risk defined?

A: Risk can be defined in different ways. One definition of risk treats it as a specific hazard. For example, an activity that is dangerous (e.g., smoking) is a risk. A second way to look at risk is as a probability (e.g., "What is the risk [i.e., probability] of getting cancer from smoking?"). A third way to view risk is as a negative outcome or the consequence of the dangerous behavior, i.e., "What is the risk of smoking? (Answer: getting cancer)." Risk can also be viewed as a blend of the likelihood of the hazard and the impact or negative consequences associated with the hazard. These are all what I would call definitions of risk based on "risk as analysis." But the most common way of thinking about risk is as an instinctive "gut feeling;" i.e., "risk as a feeling."

Q: Is one of these definitions more valid than the others?

A: They are all valid in that they define how individuals think and talk about risk.

Q: When you discuss an individual's perception of risk, as it relates to smoking, what definition do you use?

A: I use all of these definitions in one way or another to examine whether individuals understand the "risk" of smoking. For example, do people perceive smoking to be a hazard? What do they believe are the consequences of smoking? How likely do they

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believe these consequences are to occur? What is the degree of risk associated with smoking (probability and severity of consequences)? And, how do they feel about the risk?

Q: What is the concept of cumulative risk?

A: Cumulative risk refers to the concept that the likelihood of harm occurring increases as the activity is repeatedly engaged in. In other words, risk accumulates over time, with repeated exposure to the hazard.

Q: Does smoking represent a cumulative risk?

A: Yes.

Q: In what sense?

A: Cigarette smoking is a behavior that takes place one cigarette at a time. The risk associated with smoking one cigarette is very small. However, a person smoking one pack of cigarettes every day for 40 years consumes about 300,000 cigarettes and the risk accumulates with each one.

Q: What type of risk are people more likely to expose themselves to, single risks or cumulative risks?

A: Cumulative risks.

Q: Is that true even if the comparative likelihood of the two types of risks are the same?

A: Yes.

Q: Why is that?

A: Because, with cumulative risks such as smoking, the risk builds slowly and invisibly with each exposure (e.g., each cigarette). There seem to be no adverse consequences. The

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risk does not seem as imminent as it might seem when the same overall probability of harm threatens you at a single moment in time. Most people can recognize instances in their own thinking, typically involving eating, where they expose themselves to a cumulating risk thinking, “just this one (fill in your own risky food) won’t hurt me.”

Q: Is there research that supports your understanding?

A: Yes. Research described in Diamond, W.D., “Effects of describing long-term risks as cumulative or noncumulative,” *Basic & Applied Social Psychology*, 11(4), 405-419 (1990), shows that people are more willing to expose themselves to risk from a chemical carcinogen described as cumulative ("the poison builds up in your body") than to take a statistically equivalent risk described as a series of independent exposures ("the poison does not build up – if a dose does not make you sick it will pass right through you without doing any harm").

Q: Please explain how, if at all, Dr. Diamond’s research relates to smoking behavior?

A: As I explained, smoking is a cumulative risk. Yet, when young people begin to smoke they tend to believe that they can smoke for some amount of time before the risks associated with smoking have any impact on them. For example, in a survey of high school students who smoked more than six cigarettes per day, about one third believed that there is “really no risk at all” from smoking a pack of cigarettes daily for the first few years after starting to smoke, and about 40% saw no harm associated with the very next cigarette smoked. Slovic, P., “What Does it Mean to Know a Cumulative Risk? Adolescents’ Perceptions of Short-term and Long-term consequences of smoking,” *Journal of Behavioral Decision Making,* 13, 273-276 (2000) (“Slovic, 2000a”). In the

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Annenberg survey, 65% of young smokers (ages 14–22) and 70% of adult smokers said that it takes one year or longer "for smoking to harm the health of a new smoker." About 32% of youths and 45% of adults thought it would take five or more years of smoking to seriously harm health. Murphy-Hoefer, Alder, and Higbee surveyed more than 1,000 college students aged 18-24 and found very similar results. About 60% of nonsmokers believed that smoking on a weekend or a couple of days a week was harmful, whereas only 32% of smokers held this view. Murphy-Hoefer, R., Alder, S., & Higbee, C., "Perceptions about cigarette smoking and risks among college students," *Nicotine & Tobacco Research, 6* (supplement 3), S371-S374 (December 2004).

Q: Are there consequences associated with the belief that smoking for only a short time poses little or no health risk?

A: Yes. Many young people who start smoking expecting to quit soon actually do not stop smoking, and, as time passes, the risks associated with smoking become serious.

Q: Why doesn't the general knowledge that "smoking is dangerous" or "smoking causes cancer" deter people from beginning to smoke?

A: There are strong, short-term motivations to smoke, such as enhancing one's self-image or gaining approval of one's peers. Risks are not really salient. In addition to the comfort people derive from the sense that smoking for a short period of time won't hurt them, there are three other phenomena that contribute to individual under-appreciation of the risk of smoking. First, individuals tend not to have an adequate understanding of the nature of the consequences related to smoking, including the consequence of addiction. Second, it is well established that people have a particularly difficult time appreciating

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future, rather than immediate, consequences. Third, the positive feelings and imagery associated with smoking as a result of tobacco advertising and promotions work to dampen the sense of risk.

Q: Do most people appreciate that smoking is a risk factor for lung cancer, heart disease, emphysema, and other diseases?

A: The research I rely on (both mine and others), indicates that most people know only one or two of the many diseases caused by smoking. For example, a survey conducted by Weinstein, Slovic, Waters, and Gibson found that a great majority of smokers and nonsmokers realized that smoking can cause life-threatening illnesses but, except for lung cancer, no specific smoking-linked illness could be named by more than half of the respondents. About half mentioned emphysema, about a quarter mentioned any kind of cancer other than lung, and only about a quarter mentioned any kind of cardiovascular risk. About 10% did not mention cancer at all. In addition, those surveyed said they had little knowledge about the reality of what it is like to experience the pain and suffering associated with lung cancer, emphysema, congestive heart failure, or the other diseases associated with smoking (see Figure C below). More than 70% of adults and 80% of adolescents overestimated the likelihood that lung cancer was curable. Weinstein, N.D., Slovic, P., Waters, E., and Gibson, G., "Public Understanding of the Illnesses caused by Cigarette Smoking," *Nicotine and Tobacco Research* (April 2004) ("Weinstein, et al., 2004").

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Figure C. **Percent of survey respondents answering that they know only "a little" or "not much at all" about the pain and suffering associated with lung cancer and emphysema.**

	Adolescents		Adults	
	Smokers	Nonsmokers	Smokers	Nonsmokers
Lung cancer	53	73	49	46
Emphysema	68	81	54	45

Source: Weinstein, et al., 2004

In other words, people know little more than the names of a few of the smoking attributable diseases. They do not have a realistic understanding of the severity of the diseases, the survival rate of individuals afflicted with these diseases, the nature of the suffering associated with these diseases, or the average length of time one endures the affects of the disease before either recovering or dying from the disease. Although lung cancer, emphysema, congestive heart failure, and other pulmonary and cardiac diseases caused by smoking entail excruciating suffering with little chance of survival, information such as this is not part of many individuals' understanding of the nature of the adverse consequences of smoking.

It is therefore important to distinguish between superficial awareness, which entails a general recognition that smoking is dangerous, and a deeper, more meaningful knowledge, that encompasses a complete understanding of the many serious diseases caused by smoking, as well as the true nature of addiction, along with an understanding of what it would be like to experience those diseases or addiction. Moreover, such deeper knowledge would entail a recognition that *your* health is at risk. In between these

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two levels of knowledge runs a continuum along which may exist an intermediate level of "some" knowledge, where there may be a recognition that smoking causes some diseases, such as lung cancer, but where it may be hard to name others, and a further recognition that smoking may be hard to quit, but without an appreciation of the true nature of addiction. See, Demonstrative Exhibit 17421.

Q: Why do people under-appreciate future consequences?

A: Evolution has prepared us to deal with immediate threats (Is that animal lurking in the bushes dangerous? Is this water safe to drink?). Future consequences are hard to imagine. It takes much effortful and sophisticated analytic thinking to overcome these natural tendencies to focus on the present or the near term.

Q: How does this relate to smoking?

A: Many – and certainly the most serious – adverse consequences associated with smoking are likely to occur some years after one starts to smoke. Therefore, the likelihood that one will downplay any far off effects – especially combined with misperception of the cumulative risk – puts beginning smokers in the position of seriously under-appreciating the risks.

Q: Have you seen survey data that supports this view?

A: The Annenberg survey found that only 7.4% of adult smokers and 4.8% of young smokers expected to smoke longer than five years when they began, yet 87% of these adults and 76% of these youth reported that they had been smoking for more than five years.

Additional perspectives on quitting based on the Annenberg survey (Slovic, 2001,

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Chapter 6) are shown in Figures D, E, and F. Data from the Annenberg survey indicate that most smokers neither want to continue to smoke nor expect to do so. The majority of smokers had made more than one attempt to quit (Figure D), and about 65% of the adults and 84% of the young people said that they planned to quit (Figure E, Question 29). Of those who planned to quit, about 73% of the adults and 76% of the youth planned to make an attempt within the next year (Figure E, Question 29a, first two responses combined). When asked whether the researchers would find that they had successfully quit smoking if they were called again in a year (Figure E, Question 29b), 78% of the adults and 83% of the young people said yes. The actual success rate for attempts to quit smoking tends to be below 10%.

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***Figure D.* Responses to question "About how many times, if any, have you tried to quit smoking?" (in percentages)**

Number of times	Adult smokers (*N* = 310)	Young smokers (*N* = 478)
0	21.3	38.1
1	16.8	21.8
2–4	38.4	30.1
5–9	11.6	4.0
10+	9.4	4.8
Don't know/refused	2.6	1.3

Source: Annenberg Survey, Slovic, 2001, Chapter 6.

***Figure E.* Perspectives on quitting smoking (in percentages).**

Questions/responses	Adult smokers (*N* = 310)	Young smokers (*N* = 478)
Q29. Do you plan to quit smoking?		
Yes	65.5	83.7
No	30.6	13.2
Don't know/refused	3.9	3.1
Q29A: When are you planning to quit?		
Next 6 months	49.3	57.0
6 months to a year	24.1	19.5
More than a year from now	15.8	18.2
Don't know/refused	10.8	5.2
Q29B. If we called you again in a year, would you guess you would have successfully quit smoking?		
Yes	77.8	83.3
No	11.4	9.8
Don't know/refused	10.7	6.9

Source: Annenberg Survey, Slovic, 2001, Chapter 6.

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Figure F. **Plans to quit smoking by number of past attempts to quit (in percentages).**

	Number of attempts to quit							
	0		1–4		5–9		10+	
Questions/responses	AS	YS	AS	YS	AS	YS	AS	YS
Q29. Do you plan to quit smoking?								
Yes	39.4	74.7	67.8	89.5	88.9	100.0	79.3	91.3
No	54.6	22.0	28.1	7.7	11.1	0.0	20.7	8.7
Don't know	6.1	3.3	4.1	2.8	0.0	0.0	0.0	0.0
Q29A:When are you planning to quit?								
Next 6 months	38.5	56.6	46.6	55.0	62.5	57.9	52.2	76.2
6 months to a year	26.9	15.4	27.6	23.0	18.8	21.0	17.4	9.5
More than a year from now	15.4	23.5	17.2	16.3	15.6	15.8	8.7	9.5
Don't know	19.2	4.4	8.6	5.9	3.1	5.3	21.7	4.8
Q29B. If we called you in a year, would you have quit?								
Yes	88.2	86.7	81.4	85.0	69.2	66.7	56.2	61.1
No	0.0	7.1	9.3	9.2	19.2	26.7	25.0	16.7
Don't know	11.8	6.1	9.3	5.8	11.5	6.7	18.8	22.2

Source: Annenberg Survey, Slovic, 2001.

Figures F and G present the responses to these same three questions about quitting, conditioned by the number of past attempts to quit (Figure F) and by the length of time the individual had been smoking (Figure G). In Figure F we see that, except for adults who had never tried to quit, a substantial majority of smokers planned to quit (Question 29) and planned to do so within the next year (Questions 29a and 29b), even

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though they had unsuccessfully attempted to quit a number of times before. Thus we see that, among youth who had attempted to quit 10 or more times, 91.3% still planned to quit, and 85.7% of those planned to quit within the next year (Question 29a). Their estimated success rate was 61% (Question 29b).

Figure G. **Plans to quit smoking by length of time smoking (in percentages).**

	Length of time smoking							
	1 month or less		About 1 year		1–5 years		More than 5 years	
Questions/responses	AS[a]	YS	AS	YS	AS	YS	AS	YS
Q29. Do you plan to quit smoking?								
Yes	—	81.4	—	82.5	74.2	87.3	63.7	80.2
No	—	15.2	—	14.3	25.8	11.0	32.2	15.9
Don't know	—	3.4	—	3.2	0.0	1.8	4.1	4.0
Q29A: When are you planning to quit?								
Next 6 months	—	85.4	—	55.8	39.1	51.8	50.0	54.5
6 months to a year	—	6.2	—	28.8	17.4	21.6	25.6	16.8
More than a year from now	—	2.1	—	7.7	17.4	22.1	15.7	23.8
Don't know	—	6.2		7.7	26.1	4.5	8.7	5.0
Q29B. If called in a year, would you have quit?								
Yes	—	90.9	—	86.4	92.3	81.5	75.4	80.6
No	—	6.8	—	6.8	7.7	10.3	12.3	12.5
Don't know	—	2.3	—	6.8	0.0	8.2	12.3	6.9

[a]AS = adult smokers; YS = young smokers.

Source: Annenberg Survey, Slovic, 2001, Chapter 6.

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Source: https://www.industrydocuments.ucsf.edu/docs/ysjl0001

Similar optimism about quitting was evident among long-time smokers (Figure G). Even among those who had been smoking for more than 5 years, 64% of adults and 80% of young people planned to quit, and most of these individuals planned to do so within the next year. The median age of the adults who had been smoking for more than 5 years was 41, which makes it likely that they had actually been smoking for more than 20 years (more than 5 years was the longest time in the response options presented by the interviewers). It is noteworthy that these older smokers were as optimistic as young smokers about quitting within the next year.

In addition to my own research, other studies have demonstrated smokers' underestimations of the difficulties of quitting. For example, a longitudinal survey conducted as part of the University of Michigan's Monitoring the Future Study found that 85% of high school seniors who smoked occasionally predicted that they probably or definitely would not be smoking in five years. However, in a follow-up study five to six years later, of those who had smoked one to five cigarettes per day as high school seniors, only 30% had quit, and 44% had actually increased their cigarette consumption. Slovic, 2001, Chapter 6, citing Johnston, L.D., O'Malley, P.M., and Bachman, J.G. "National Survey Results on Drug Use from the Monitoring the Future Study," NIH Publication No. 93-3598, Rockville, MD: National Institute on Drug Abuse (1993); U.S. Department of Health and Human Services, "Preventing Tobacco Use Among Young People: A Report of the Surgeon General," U.S. Department of Health and Human Services.

Q: Why is underestimating the risk of addiction significant for risk perception as it relates to the health effects of smoking?

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A: The tendency of young smokers to be uninformed and to underestimate the difficulty in stopping smoking, especially in conjunction with their belief in the short-term safety of smoking, creates an insidious situation where they begin smoking without any meaningful appreciation of the actual risks that smoking presents to their health.

Q: Haven't people been hearing about addiction in connection with cigarette smoking for some time now?

A: Perhaps, but hearing about addiction and appreciating it in a meaningful way are two different things. As discussed earlier, there are various levels of knowledge one may have related to addiction, or any other phenomenon. Moreover, Dr. Loewenstein argues that addiction is an extreme form of a class of behaviors that are controlled by "visceral factors." Visceral factors include drive states such as hunger, thirst, sexual desire, moods and emotions, physical pain, and, for addiction, intense cravings for a drug or cigarette. From the experiential perspective, it is very difficult, if not impossible, to appreciate one's own susceptibility to visceral influences. As Dr. Loewenstein observes: "Unlike currently experienced visceral factors, which have a disproportionate impact on behavior, delayed visceral factors tend to be ignored or severely underweighted in decision making. Today's pain, hunger, anger, etc., are palpable, but the same sensations anticipated in the future receive little weight." (p. 240). Loewenstein, G. F. "A visceral account of addiction," In J. Elster & O. J. Skog (Eds.), *Getting hooked: Rationality and addiction* (pp. 235-264), New York: Cambridge University Press (1999).

In addition to the misperceptions pointed out by Dr. Loewenstein, another problem is optimism bias.

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Q: What is optimism bias?

A: Optimism bias is a psychological phenomenon whereby people consistently assert that their personal risk from some activity or hazard is less than the risk faced by others. It has been found to be greatest for hazards felt to be controllable by personal action, such as lifestyle risks. Also, optimism bias is greater when people believe that signs of vulnerability will appear early, such that an absence of present, visible signs means they are exempt from future harms.

Q: Does optimism bias contribute to your conclusion that people underestimate the risk of smoking?

A: Yes, especially as it relates to addiction. One tends to think of the decision to stop smoking as controllable by personal action. Moreover, there is often an absence of present, visible signs of addiction when one begins to smoke. Therefore, smoking is a classic candidate for behavior in which people exhibit optimism bias.

Q: Generally, do individuals understand the risks associated with smoking adequately enough to make an informed decision about whether to smoke?

A: No. As indicated earlier, beginning smokers tend not to think about the risks. If they do, they tend to be unconcerned about the potential risks, as the negative consequences appear remote in time. Moreover, they have a very limited understanding of the severe nature of the adverse consequences associated with smoking, i.e., lung cancer, emphysema, congestive heart failure, and other lung and cardiovascular diseases. Added to this is the fact that smoking presents a cumulative risk and beginning smokers tend to negate or downplay the risks associated with the initial stages of smoking. This,

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combined with the fact that people likewise underestimate the risk of addiction to smoking, creates a situation in which many people begin to smoke without an adequate appreciation of the risks to which they are exposing themselves.

Q: What research supports the conclusion that smokers are not making informed decisions to smoke?

A: An uninformed decision is a behavior commenced without a meaningful understanding or appreciation of the risks involved, as opposed to an informed decision pursuant to which people simply choose to engage in behavior attendant with known potential adverse consequences, such as skiing. Further evidence that beginning smokers are uninformed is the finding that, as people become more experienced smokers, they overwhelmingly regret having started smoking. Annenberg Survey, Slovic, 2001, Chapter 6. Smokers in the Annenberg survey were asked, "If you had it to do over again, would you start smoking?" The results, shown in Figure H below, are clear. More than 85% of adult smokers and about 80% of young smokers answered no. Moreover, the pattern of responses shown in the exhibit was similar for both young and adult smokers. The more they felt addicted to cigarettes, the more often they had tried to quit, the longer they had been smoking, and the more cigarettes they were smoking per day, the more likely they were to say they would not start smoking given the chance to begin anew.

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Figure H. **Smoking: Would you start again? (in percentages)**

	Adult smokers (*N* = 310)		Young smokers (*N* = 478)	
Questions/responses	Yes	No	Yes	No
Overall	11.9	85.5	17.0	80.1
Q32. Do you consider yourself addicted to cigarettes?				
Yes	11.4	86.9	13.9	84.3
No	14.3	81.4	21.8	74.6
More than average	7.7	90.4	7.1	92.9
Same as average	11.1	85.6	15.3	80.9
Less than average	16.2	83.8	20.4	77.0
Q30. Number of times tried to quit?				
0	27.3	66.7	22.5	73.1
1–4	9.4	88.3	14.5	83.9
5–9	8.3	91.7	10.5	84.2
10+	0.0	100.0	4.4	95.6
Q31. How long have you smoked?				
Few months or less	—	—	22.0	74.6
About 1 year	—	—	20.6	76.2
1–5 years	19.4	80.7	16.7	79.4
More than 5 years	11.1	86.3	13.5	86.5
Q26. Cigarettes smoked per day last 30 days?				
Less than 1	16.1	83.9	25.3	69.5
1–5	10.5	89.5	18.9	77.5
6–10	10.0	88.0	19.4	79.6
11–14	11.1	86.1	13.4	83.6
15–19	15.4	82.0	5.9	91.2
20	10.4	85.1	7.0	93.0
More than 20	11.4	86.4	12.1	87.9

Source: Annenberg Survey, Slovic, 2001, Chapter 6.

This is a strong repudiation of the notion that smoking is an informed rational choice. It

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fits well with findings that indicate that smokers give little conscious thought to risk when they begin to smoke (Figure B, Question 19a). They appear to be lured into the behavior by the prospects of fun and excitement. Most begin to think of risk only after they have started to smoke and have gained what to them is new information about health risks. The increased likelihood of smokers' repudiating their earlier decision exhibited by those who have been smoking for the longest time, those who are currently smoking the most cigarettes, those who perceive themselves at high risk from smoking, those who have tried most often to quit, and those who acknowledge their addiction, presents a disturbing picture of individuals who are unable to control a behavior that they have come to recognize as harmful.

Q: Have you further researched the question of whether smokers would start smoking again, if given the opportunity to begin anew?

A: Yes. As discussed later, I found that a similar question had been asked in a poll reported in a 1984 tobacco industry document (U.S. Exhibit 21,460). Over 85% of smokers were found to agree strongly or very strongly with the statement "I wish I had never begun smoking."

More recently, this question was asked in England in a representative national survey of 893 smokers. Jarvis, McIntyre, & Bates, "A Picture of Misery: The Truth About Smoking, In Smokers' Own Words," unpublished article (2002) ("Jarvis, et al., 2002"). When asked: "If you had your time again would you start smoking?," 83% of current smokers replied that they would not. Dr. Neil Weinstein and I asked the Annenberg version of the "Would you do it again?" question in our December 2000

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survey. Again, some 86% of smokers answered "no" to this question.

Most recently, Fong, et al. asked more than 8,000 smokers in Canada, the United States, the United Kingdom, and Australia whether they agreed or disagreed with the statement, "If you had it to do over again, you would not have started smoking." The rate of agreement was high—about 90%—and nearly identical across the four countries. Fong, G. T., Hammond, D., Laux, F. L., Zanna, M. P., Cummings, K. M., Borland, R., & Ross, H., "The near-universal experience of regret among smokers in four countries: Findings from the International Tobacco Control Policy Evaluation Survey," *Nicotine & Tobacco Research, 6* (Supplement 3), S341-S351 (December 2004).

Q: Can you attribute these answers to smokers giving what they think is the socially desirable answer when they say they would not begin to smoke again?

A: No, not in my estimation. In the survey with Dr. Weinstein, if a person answered "no" we then asked "Why not?" There was nothing socially desirable in their responses, but rather a startling litany of self-loathing. Some 470 codable responses were assigned to 1 of 15 categories as shown in Figure I. One can see that the reasons given were extremely negative. A sampling of specific responses is shown in Figure J, representing almost all of the categories in Figure I. One can see that there is absolutely nothing socially desirable about these answers.

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***Figure I.* Categories of answers to: "If you had to do it over again would you start smoking? Why not?"**

Categories	Percent response
It's risky/dangerous/unhealthy	23.0
Expense	15.3
Addiction/addictiveness	12.3
Makes me feel bad/sick (trouble breathing)	10.9
Bad imagery/negative expression (e.g., nasty, disgusting, dirty, crazy, stupid, bad habit, nasty habit)	8.1
Not pleasant/not fun/no reason to smoke	5.5
Bad taste or smell	5.3
New knowledge/lack of knowledge when started/experience	5.1
General consequences (I've seen what happens)	3.6
Social stigma (They are offensive to people)	2.8
Miscellaneous	2.8
Worry about death (Want to see kids grow up)	1.9
It hurts the people around you	1.3
New attitude (I don't think it's cool any more)	1.1
Self-critical/self-degrading (dumb to smoke)	1.1

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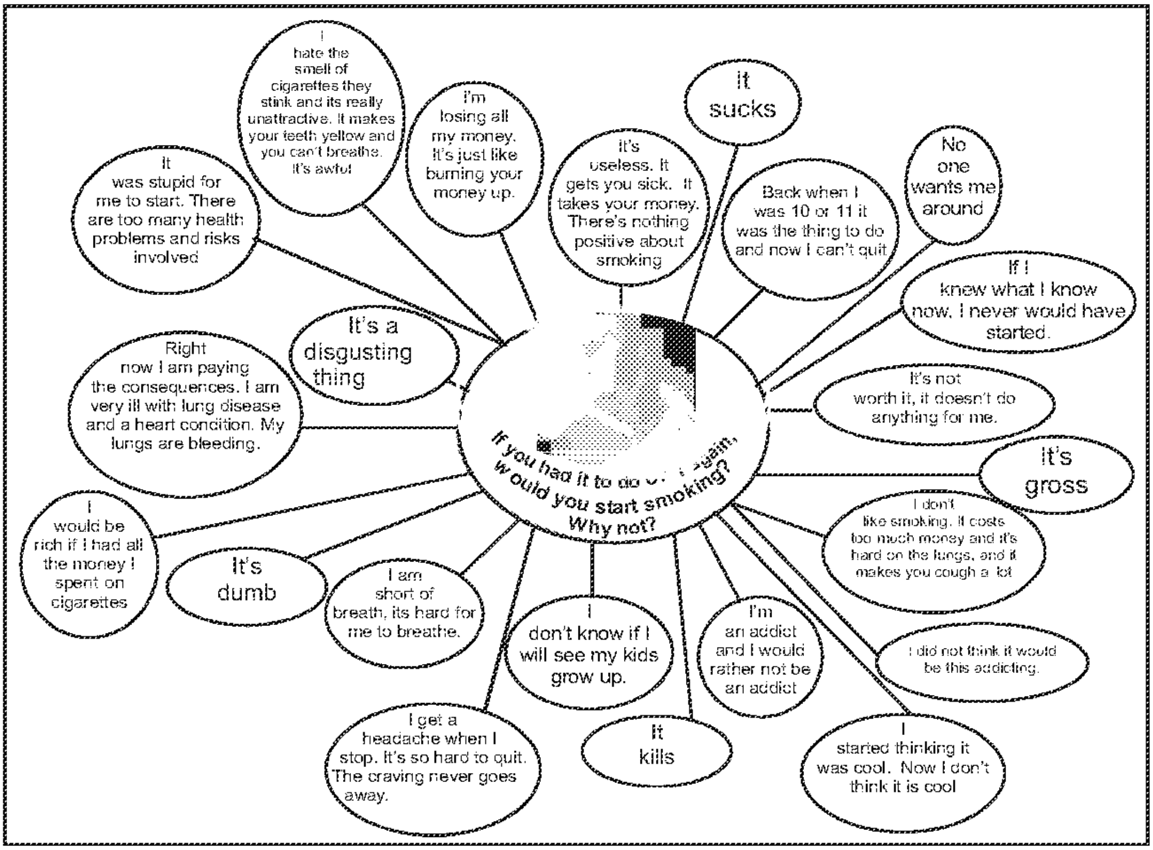
Figure J. A picture of misery. Smokers who would not do it over again answer the question "Why not?" (Source: Unpublished data, Weinstein & Slovic, 2001).



Jarvis, McIntyre, and Bates also included the "Why not?" question in their survey in England and found the same extreme negativity in the responses, leading them to title their report "A Picture of Misery." Jarvis, et al., 2002.

Q: What are the likely results if people had a more complete understanding of the risks associated with smoking during the initiation process?

A: Smoking rates have declined substantially over the years and this may well be due to a better understanding of the risks. However, the behavior of many young people is based on affect rather than on an analysis of quantitative statistical facts. Therefore, even with access to complete information about smoking risks, such information may not be

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considered. As I indicated earlier, young smokers often say that, when starting to smoke they did not think about the risks but rather concentrated on the fun and excitement they associated with smoking.

Q: To what do you attribute this?

A: Based on my research, I conclude that when beginning to smoke, young people generally rely on affective feelings rather than reasoned analysis.

Q: What is affect?

A: Affect is a subtle form of emotion, defined by positive or negative evaluative feelings toward an external stimulus. As related to smoking, an example of such stimuli are cigarettes themselves, the act of smoking, or images of cigarettes and people smoking. Positive feelings toward cigarettes will tend to motivate smoking behavior and negative feelings will tend to deter it.

Q: How does affect relate to decision making?

A: Affective decision making is decision making that relies on affect and emotion, through what is known as experiential thinking. It occurs rapidly and automatically. It is based on one's experiences and feelings, and does not rely on analytic calculations or reasons.

Among academic researchers who study decision making, psychologist Robert Zajonc was among the first to point out the importance of affect. In a classic study, published in 1980, he argued that affective reactions to stimuli are often the very first reactions, occurring automatically and subsequently guiding information processing, judgment, and decision making. Zajonc, R. B., "Feeling and thinking: Preferences need no inferences," *American Psychologist, 35*, 151-175 (1980).

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One of the most comprehensive and dramatic theoretical accounts of the role of affect and emotion in decision making was presented by the neurologist Antonio Damasio. In seeking to determine "[w]hat in the brain allows humans to behave rationally," Damasio argued that thought is made largely from images, broadly construed to include perceptual and symbolic representations. A lifetime of learning "marks" these images with positive and negative feelings linked directly or indirectly to somatic or bodily states. When a negative somatic marker is linked to an image of a future outcome, it sounds an alarm. When a positive marker is associated with the outcome image, "it becomes a beacon of incentive." Slovic, 2001, Chapter 6, citing Damasio, A.R., *Descartes' error: Emotion, reason, and the human brain*, New York: Avon (1994) ("Damasio, 1994").

Q: What does research show on the role of affect in people's thinking?

A: Research in cognitive psychology has demonstrated that people think and apprehend reality in two different ways. The experiential mode of thinking is intuitive, automatic, natural, and reliant upon imagery and affect. The analytic mode is deliberative, logical, and reason-based. This type of thinking entails the collection of data, considered calculations, consideration of probabilities, and so on. It is a slow methodical type of thinking. These two modes are part of what have come to be known as dual-process theories of thinking, knowing, and information processing. One such dual-process theory is illustrated in Figure K below.

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Figure K. **Two modes of thinking: Comparison of the experiential and analytic systems.**

Experiential system	Analytic system
• Holistic	• Logical: reason oriented (what is sensible)
• Affective: pleasure-pain oriented	• Logical connections
• Associationistic connections	• Behavior mediated by conscious appraisal of events
• Behavior mediated by "vibes" from past experience	• Encodes reality in abstract symbols, words and numbers
• Encodes reality in concrete images, metaphors and narratives	• Slower processing: oriented towards delayed action
• More rapid processing: oriented towards immediate action	• Requires justification via logic and evidence
• Self-evidently valid: "experiencing is believing"	

Note. Adapted from Epstein, 1994.

Q: Is one type of thinking generally better than the other?

A: No. Traditionally, it was thought that analytic thinking was more central to rationality and, as the more sophisticated method, the better way of thinking. However, in recent years, experiential thinking has come to be respected as a sophisticated way of thinking that is essential to rational behavior. Both processes serve individuals well under certain circumstances and both can be detrimental to individuals under different sets of circumstances.

Q: In what types of circumstances does one work better than the other?

A: By way of example, analytic thinking works well when one is attempting to solve a complex mathematical problem, though, as the great mathematician Poincaré observed,

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even mathematicians are guided by affective processes when proving theorems (e.g., "Does this proof feel right?" "It is elegant?"). On the other hand, analytic thinking disserves an individual who needs to quickly react to avoid being hit by a speeding car racing toward him.

Q: When beginning to smoke, do young people generally employ a certain type of thinking?

A: Yes. Based on the research I and others have conducted, I believe that young people tend to rely heavily on experiential thinking when starting to smoke. As stated earlier, affective cues emanating from the social environment are powerful influences on smoking behavior (e.g., Figure B, Question 19e). Having a good time with friends and avoiding the risk of peer disapproval are examples of social factors in which affect (experiential thinking) appears to dominate any tendency for analytic or deliberative thinking.

Q: Are there stimuli that people are exposed to that trigger affective responses to smoking?

A: Yes, there are. For example, the tobacco companies have utilized their understanding of affective or experiential thinking to create advertising and marketing campaigns that are explicitly designed to associate positive imagery and positive affect with the act of smoking. The primary strategy underlying advertising is to depict attractive people, performing attractive, exciting, or adventurous activities, in beautiful surroundings. These positive images become associated with smoking and thus motivate smoking initiation and maintain smoking behavior.

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Q: Are there other ways that marketing creates positive feelings toward smoking?

A: Imagery is immensely important and tobacco companies have long used sophisticated methods to employ it effectively. But there is a phenomenon called "mere exposure" by which repeated exposure to cigarette brands would be expected to create positive feelings toward those brands. Potential consumers' mere exposure to the various cigarette brands therefore reinforces the positive feelings created by the imagery they have been exposed to.

Q: How does mere exposure work to create positive attitudes and feelings?

A: The notion that repeated exposure to a stimulus is sufficient to produce more positive attitudes toward the stimulus is an old idea, dating to the late 1800s. In 1968, Dr. Zajonc reviewed nearly a century of research supporting this idea and then presented the results of four experiments that provided strong support for it. In one experiment, college students viewed college yearbook photographs of men 1, 2, 5, 10, or 25 times and then rated how much they liked the men. A significant positive relation between frequency of exposure and liking emerged. Research has continued to demonstrate that familiar stimuli are preferred to unfamiliar stimuli. That is, presenting novel stimuli repeatedly without any reinforcement produces more positive attitudes toward those stimuli. This effect has been termed the *mere exposure effect*. Slovic, 2001, Chapter 6, citing Zajonc, R. B., "Attitudinal Effects of Mere Exposure, *Journal of Personality and Social Psychology Monograph*, 9(2, Pt. 2), 1-27 (1968). It has been found robustly in humans (for a review, see Bornstein, R.F. "Exposure and Affect: Overview and Meta-analysis of Research, 1968-1987, *Psychological Bulletin,* 106, 265-289 (1989) ("Bornstein, 1989").

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Q: How extensive must an exposure be to create positive affect?

A: In some cases, only minimal exposure is needed to associate a given stimulus with positive feelings or affect. In fact, even subliminal exposures, presented for as little as 1/250 of a second (below the threshold of awareness) can create positive affect and preferences for stimuli. Bornstein, R.F., Leone, D.R., & Galley, D.J., "The Generalizability of Subliminal Mere Exposure Effects: Influence of Stimuli Perceived Without Awareness on Social Behavior, *Journal of Personality and Social Psychology,* 53(6), 1070-1079 (1987); Winkielman, P., Zajonc, R.B., & Schwarz, N., "Subliminal Affective Priming Resists Attributional Interventions," *Cognition and Emotion,* 11, 433-465 (1997).

Q: Generally, how does exposure to stimuli impact on an individual's perception of risk related to a given event or activity?

A: A decision making process known as the Affect Heuristic serves to explain why exposure to certain stimuli – which serves to evoke positive affect and preference for those stimuli – depresses one's perception of risk associated therewith.

Q: What is the Affect Heuristic?

A: Affect, as I've explained earlier, is the process by which people rely on their feelings, either positive or negative, in evaluating an external stimulus. A heuristic is a natural process that we rely on to guide our judgment and behavior. Thus, the affect heuristic is a model for the way people react to stimuli based on experiential or affective reasoning.

Q: What is the basis for the affect heuristic?

A: The affect heuristic grew out of the observation, in many studies, that risk and benefit

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tend to be negatively related in people's minds. Fischhoff, B., Slovic, P., Lichtenstein, S., Reed, S., & Combs, B., "How Safe is Safe Enough? A Psychometric Study of Attitudes Towards Technological Risks and Benefits," *Policy Sciences*, 9, 127-152 (1978). For many hazards, the greater the perceived benefit, the lower the perceived risk, and vice versa. Nuclear power, use of pesticides, and consumption of food additives, for example, tend to be seen as very high in risk and relatively low in benefit, whereas the use of medicines and X-rays tend to be seen as high in benefit and relatively low in risk. This negative relationship is noteworthy because it occurs even when the nature of the gains or benefits from an activity is distinct and qualitatively different from the nature of the risks. That the inverse relationship is generated in people's minds rather than learned by experience is suggested by the fact that risk and benefits generally tend to be positively (if at all) correlated in the world. Activities that bring great benefits may be high or low in risk, but activities that are low in benefit are unlikely to be high in risk (if they were, they would be proscribed). Yet the relationship between risk and benefit in people's minds seems to be opposite to this.

Q: How does this relate to affect?

A: A peer reviewed study by Alhakami and Slovic found that the inverse relationship between the perceived risk and perceived benefit of an activity (e.g., using pesticides) was linked to the strength of positive or negative affect associated with that activity. This result implies that people base their judgments of an activity or a technology not only on what they *think* about it but also on what they *feel* about it. If they like an activity, they are moved to judge the risks as low and the benefits as high; if they dislike it, they tend to

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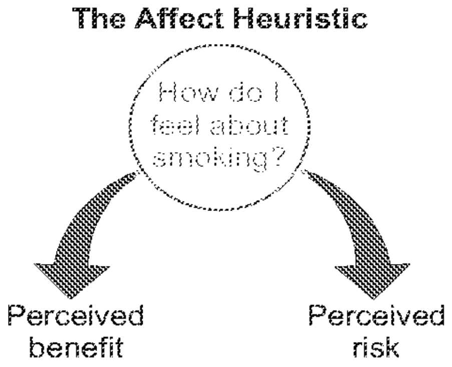
judge the opposite—high risk and low benefit. Alhakami, A.S., Slovic, P., "A Psychological Study of the Inverse Relationship Between Perceived Risk and Perceived Benefit," *Risk Analysis*, 14(6), 1085-1096 (1994) ("Alhakami and Slovic, 1994").

Figure L. A model of the affect heuristic explaining the risk/benefit confounding observed by Alhakami and Slovic (1994). Judgments of risk and benefit are assumed to be derived by reference to an overall affective evaluation of the stimulus item.



These findings suggest that use of the affect heuristic guides perceptions of risk and benefit as depicted in Figure L. If so, providing information about risk should change the perception of benefit and vice versa (see Figure M). For example, information stating that benefit is high for some activity or technology should lead to more positive overall affect, which would, in turn, decrease perceived risk. Indeed, Finucane et al. conducted an experiment with a design similar to that in Figure M. Finucaine, M.L., Alhakami, A., Slovic, P., & Johnson, S.M., "The Affect heuristic in

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Judgments of Risks and Benefits," *Journal of Behavioral Decision Making,* 13, 1-17 (2000) ("Finucaine, et al., 2000"). They provided four different kinds of information designed to manipulate affect by increasing or decreasing perceived risk and increasing or decreasing perceived benefit. In each case there was no apparent logical relation between the information provided (e.g., information about risks) and the nonmanipulated variable (e.g., benefits). The predictions were confirmed. When the information that was provided changed either the perceived risk or the perceived benefit, an affectively congruent but inverse effect was observed on the nonmanipulated attribute, as depicted in Figure M. These findings support the theory that risk and benefit judgments are causally determined, at least in part, by the overall affective evaluation.

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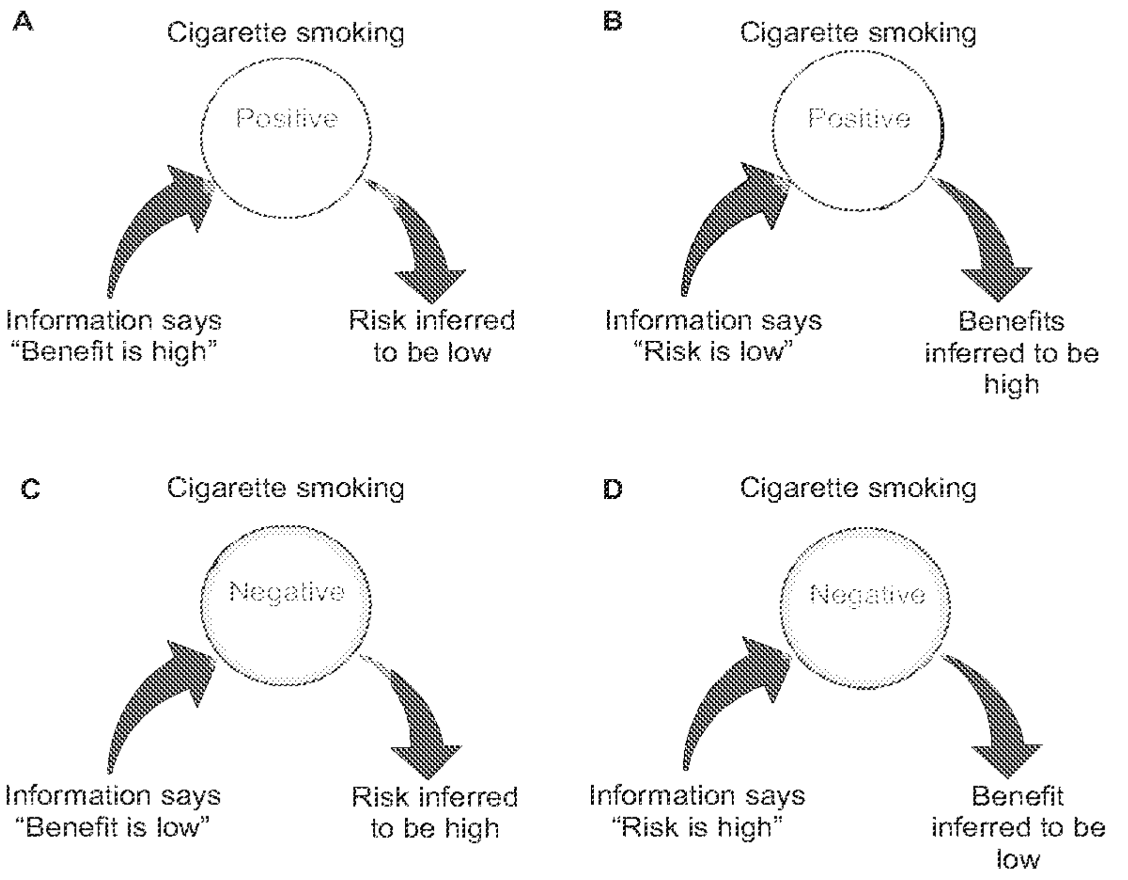
Figure M. Model showing how information about benefit (A) or information about risk (B) could increase the overall affective evaluation of cigarette smoking and lead to inferences about risk and benefit that coincide affectively with the information given. Similarly, information could decrease the overall affective evaluation of cigarette smoking as in C and D, leading to corresponding changes in perceived risk and perceived benefit. Source: Adapted from Finucane et al. (2000).



Q: How does this relate to smoking?

A: Cigarette advertising is designed to associate imagery that conveys positive affect with cigarettes and smoking. In addition to positive images, display of even the brand name or package may create positive affect through the mere exposure effect. Other promotional efforts (e.g., attractive packaging, gifts to consumers, sponsorship of athletic and entertainment events) likewise are designed to increase the positive affect associated with

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smoking. As positive affect increases, the perceived risk of smoking would be expected to decrease through the operation of the affect heuristic. By the same heuristic process, subsequent pleasurable experiences associated with smoking (e.g., good taste, relaxation, social facilitation) will also reduce the perceived risk. As a result, as people are exposed to these various stimuli, their attraction to smoking (and particular brands) is enhanced, while their perception of risk associated with smoking (or smoking particular brands) is likely depressed.

Q: Does the affect heuristic apply to all human thinking?

A: Yes. Dual process theories (see Figure K), of which affect is an essential component, are models of all human thought. In fact, it is now widely recognized that affect is essential to rational decision making. Individuals who are unable to associate affective feelings and emotions with the anticipated consequences of their actions become socially dysfunctional even though they may be capable of analytic reasoning (Damasio, 1994). The sense of risk, embodied in our instincts and feelings, helped humans survive the process of evolution. However, reliance on feelings can also get us into trouble. The experiential mode of thinking did not evolve to protect us from invisible hazards with delayed effects, such as the harmful substances in cigarettes.

Q: Is your conclusion that smokers generally underestimate or under-appreciate the risks associated with smoking widely accepted by those who study risk perception and smoking?

A: It is widely, but not universally, accepted.

Q: To the extent it is not universally accepted, on what basis is it questioned?

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A: A view exists, proposed by Dr. Kip Viscusi, that people generally, and particularly younger individuals, not only know the risks from smoking, they overestimate those risks. In his book titled *Smoking: Making the Risky Decision,* Dr. Viscusi (1992) addresses the following question: "At the time when individuals initiate their smoking activity, do they understand the consequences of their actions and make a rational decision?" (p. 11). He concludes that they do.

Q: On what data does Dr. Viscusi rely?

A: The primary data upon which Dr. Viscusi (1992) relies in his book come from a national survey of more than 3,000 persons ages 16 and older in which respondents were asked, "Among 100 cigarette smokers, how many do you think will get lung cancer because they smoke?" Analyzing responses to this question, Dr. Viscusi asserted that people greatly overestimated the risks of a smoker getting lung cancer. They also appeared to overestimate overall mortality rates from smoking and loss of life expectancy from smoking. In fact, he found that for the full national sample the average risk estimate for lung cancer mortality from smoking was .426. Moreover, young people (ages 16-21) overestimated these risks to an even greater extent than did older people (the mean risk estimate for respondents aged 16-21 was .490).

Q: What does Dr. Viscusi conclude from these data?

A: Dr. Viscusi (1992) argues that these data support a rational learning model in which consumers respond appropriately to information and make reasonable trade-offs between the risks and benefits of smoking. With respect to youth, he concludes that his findings "strongly contradict the models of individuals being lured into smoking at an early age

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without any cognizance of the risks" (p. 143). Dr. Viscusi further concludes that young people are so well-informed that there is no justification for informational campaigns designed to boost their awareness. Finally, he observes that social policies that allow smoking at age 18 "run little risk of exposing uninformed decision makers to the potential hazards of smoking" (p. 149). Dr. Viscusi's data and conclusions thus appear to support the argument that smokers know the risks and make informed, rational choices to smoke.

Q: Do you agree with Dr. Viscusi's conclusions?

A: No.

Q: Why is that?

A: Dr. Viscusi's arguments are lacking in a number of respects, as I have indicated in published studies. Slovic, 2000a; Slovic, P., "Rejoinder: The Perils of Viscusi's Analyses of Smoking Risk Perceptions," *Journal of Behavioral Decision Making*, 13, 273-276 (2000) ("Slovic, 2000b"). First, Dr. Viscusi neglects to take into account or test for the effects of optimism bias, a phenomenon that has been the subject of many scientific papers during the past several decades. Weinstein, N.D., "Accuracy of Smokers' Risk Perceptions," *Annals of Behavioral Medicine,* 20(2), 135-140 (1998) ("Weinstein, 1998"); Weinstein, N.D., "Smokers' Recognition of Their Vulnerability to Harm," In P. Slovic (Ed.), *Smoking: Risk Perception, and Policy* (pp. 81-96) Thousand Oaks, CA: Sage Publications (2001). He relies on research questions that ask about risks to other people. As a result, the answers likely do not represent the personal risk perceived by the smoker. Second, he fails to demonstrate that smokers appreciate the unpleasant, debilitating consequences of smoking-induced morbidity. The data I

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presented earlier in this testimony shows that knowledge of consequences tends to be superficial. Third, he fails to demonstrate that smokers appreciate the cumulative nature of smoking risks and the power of addiction that makes it extraordinarily difficult for them to stop smoking when they wish to do so. Data I presented earlier shows that awareness of these important factors is also superficial. Fourth, he fails to demonstrate that warnings or statistics about the risks of smoking are motivating to adolescents whose behaviors appear to be driven primarily by impulse and affect. Slovic, 2001, Chapter 6; Spear, L.P., "Neurobehavioral Changes in Adolescence," *Current Directions in Psychological Science,* 9(4), 111-114. Data I presented earlier in Figure B supports the view that smoking initiation is driven by near-term pleasures with little attention to long-term risks.

Q: Do you disagree with any other aspects of Dr. Viscusi's conclusions?

A: Yes. Although Dr. Viscusi's arguments may seem, at first glance, to have merit from the standpoint of experiential thinking as well as from his analytic perspective, I believe there are a number of ways in which reliance on experiential thinking leads smokers to fail to appreciate risks and to act in ways that are not in their best interests. First, within the experiential mode of thinking, "seeing is believing," and young people in particular are likely to see little or no visible harm from the smoking done by their friends or themselves. Second, the exposure to information that Dr. Viscusi believes causes overestimation of risk can be viewed in more than one way. The major exposure comes from massive advertising and marketing campaigns designed to associate positive imagery and positive affect with cigarette smoking.

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More subtle than the content of cigarette advertisements is the possibility that the "mere exposure effect" that results from viewing them repeatedly also contributes to positive affect for smoking in general and for specific brands of cigarettes in particular. Through the workings of the affect heuristic, this positive affect would be expected not only to enhance individuals' attraction to smoking but to depress the perception of risk (Finucane et al., 2000).

Q: Would you please address the significance of the survey data upon which Dr. Viscusi relies?

A: Dr. Viscusi's qualitative risk estimates are unreliable and invalid. He places great weight on questions such as: "Among 100 cigarette smokers, how many will die of lung cancer because they smoke?" There are a number of serious problems with this question. First, he asked respondents to estimate the risks to 100 smokers, not to themselves. Answers for themselves would likely be lower, as a result of optimism bias (Weinstein, 1998). Second, Tversky and Koehler have developed and tested a theoretical model, *support theory,* that shows that respondents asked to judge the likelihood for one focal event (e.g., lung cancer) produce higher probabilities than do respondents asked for judgments of the same event in the context of other alternative events (e.g., other causes of death). Slovic, 2001, Chapter 6, citing Tversky, A., Koehler, D.J. "Support Theory: A Nonextensional Representation of Subjective Probability," *Psychological Review*, 101, 547-567 (1994). Third, we would expect that young smokers, as experiential rather than analytic thinkers who do not expect to be smoking much longer, would not be paying careful attention to tracking lung cancer rates among smokers. Hence they would not have firm quantitative

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estimates in their heads.

Q: Have you conducted research to test the validity of your conclusions?

A: Yes. The Annenberg survey tested these hypotheses by first replicating Dr. Viscusi's line of questioning and then adding a variation in the question format along the line suggested by Tversky and Koehler's theory. Early in the survey, respondents were asked to "imagine 100 cigarette smokers, both men and women, who smoked cigarettes their entire adult lives. How many of these 100 people do you think will die from lung cancer?" This was immediately followed by a similar question asking about the number of lung cancer deaths among 100 *nonsmokers*. Next, a third question asked for respondents' estimates of the numbers of deaths among these same 100 smokers from (a) automobile accidents, (b) heart disease, (c) stroke, (d) lung cancer, and (e) all other causes combined.

Figure N presents the means of the estimates for lung cancer among the 100 smokers inquired about in the first and third questions. The answers to the first question, about lung cancer alone, were in the range obtained in Dr. Viscusi's surveys, with estimates by the youth sample being larger than estimates by the adults (60.4% of youth and 48.5% of adults).

Q: Doesn't this result support Dr. Viscusi's conclusion that the risks are overestimated?

A: No. The estimates for lung cancer in Question 1 decreased by more than 50% when made in the context of the other causes (Question 3). The proportions of respondents who reduced their first estimates when given a small number of alternative causes of

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death in Question 3 were 72.5% (adults) and 80.9% (youth). Furthermore, the correlation between the two estimates, a form of reliability, was very low, only .33 for the adults and .19 for the younger respondents.

Q: What did you conclude from this analysis?

A: These results replicate and extend findings I and others obtained earlier with a sample of university students (Slovic, 2000b). Thus one can get a wide range of estimates for lung cancer (or any other smoking-induced cause of death) simply by varying the number of other causes respondents are also asked to judge.

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Figure N. **Judged deaths from lung cancer among 100 smokers.**

	Adult sample mean (*N* = 1,416)	Youth sample mean (*N* = 2,002)
Question 1	48.5	60.4
Question 3	23.5	28.3
% Q3 > Q1	72.6	80.9

Q: Does it change your conclusion given that the average estimates for Question 3 are still higher than the statistical rate of lung cancer among smokers?

A: No, because that is not the message from this data. The point demonstrated here is that respondents do not have this probability in their heads. In essence, they are making the number up. If one added more causes of death to the mix, the estimate for lung cancer would go even lower. The results are not at all stable.

Q: Do you have any other support for the proposition that people do not make a meaningful association between the probabilities given in response to Dr. Viscusi's question and the events they supposedly represent?

A: Yes. The most frequent response in Dr. Viscusi's data is "50 out of 100." In fact, Dr. Viscusi (1992, p. 68) concludes that "The population at large views the lung cancer risk from smoking as almost a 50-50 proposition." However, independent studies by Fischhoff and Bruine de Bruin and others have demonstrated that most responses of "50" are meant to indicate "I don't know," rather than 50% likelihood. Perhaps this is linked to the common interpretation of the phrase "50-50," as an indicator of uncertain knowledge. This is further evidence that respondents do not know what probability to

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give in response to the Viscusi question. Slovic, 2001, citing Fischhoff, B., & Bruine de Bruin, W., "Fifty-fifty = 50%?" *Journal of Behavioral Decision Making,* 12, 149-163 (1999).

Q: What have you determined about Defendants' marketing practices that are relevant to your conclusions?

A: I have concluded that the tobacco companies have, for many years, undertaken sophisticated market research and consumer studies to understand that, when beginning to smoke, individuals are influenced more by imagery, positive affect, emotion, and social relationships through their experiential thinking than by logic, reason, or analysis of risk. The companies have utilized this understanding in promoting and marketing their cigarettes. As a result, consumers and potential consumers experience positive feelings toward smoking and a reduced perception of risk. Because of these feelings and perceptions, it is more likely that non-smokers will start smoking and current smokers will not quit.

Q: On what do you base these conclusions?

A: I base my conclusions on my understanding of human decision making, on the existing literature related to decision making and risk analysis, and on empirical studies (my own and others') regarding people's understanding of risk as it relates to beginning to smoke and continuing to smoke. I also base my conclusion on a review of internal tobacco company documents produced in this case, including documents pertaining to consumer research, marketing, promotion, and advertising.

Q: Do Defendants' documents describe the methods used by Defendants to study

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consumer needs and motivations?

A: Yes. They demonstrate that, at least as early as the 1970s, the industry employed talented marketing researchers, who used sophisticated methods to uncover consumer needs and motivations that could be addressed in targeted advertising and promotion campaigns. These methods included focus groups and large surveys designed to measure smoking behavior, people's attention to advertising materials, and their attitudes and emotional responses toward those materials.

Q: Can you please provide some examples?

A: Yes. For example, U.S. Exhibit 22055 is a report entitled "A Qualitative Assessment of Camel Advertising Equity," prepared by Ellison Qualitative Research, Inc. for R.J. Reynolds Tobacco Company, dated October, 1991. According to the report, "comprehensive diagnostic research" was conducted to provide insights into various issues. (U.S. Exhibit 22055 at 2). The research methodology was described as "consist[ing] of eight focus groups among adult smokers of filtered, non-menthol cigarettes recruited according to . . . [certain] specifications." (U.S. Exhibit 22055 at 4). The following areas of inquiry were explored:

- Top-of-mind motivations for smoking CAMEL primarily or secondarily.
- In-depth exploration into JOE CAMEL imagery – i.e., an open-ended exploration of who JOE is – lifestyle; personality; assets/liabilities; perceived relevance; etc.
- Comparative perceptions of/feelings about JOE CAMEL v. The MARLBORO MAN.
- Feelings/attitudes/points of view stimulated by exposure to an array of existing CAMEL advertising executions.
- Feelings/attitudes/points of view stimulated by exposure to an array of new executions being considered for CAMEL advertising.

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- Responsiveness to visual stimuli consisting of locations, activities and situations to explore perceived sense of appeal and/or appropriateness for both CAMEL and JOE CAMEL.

(U.S. Exhibit 22055 at 5-6). U.S. Exhibit 50628, a February 1, 1985 report, entitled Marketing Research Report, Camel Younger Adult Smoker Focus Groups, published by the marketing development department of R.J. Reynolds Tobacco Company; U.S. Exhibit 53869, an October, 1979 Brown and Williamson document, entitled, History and Key Trends in the U.S. Cigarette Market; and U.S. Exhibit 51140, a 1989 R.J. Reynolds marketing research proposal, entitled, Project VF Qualitative Research – Chicago, are other examples of the industry's use of focus groups to understand consumer reaction to advertising and marketing.

Q: Do you have examples of surveys, as well?

A: Yes. For example, U.S. Exhibit 34336, entitled, Overview of Smoker Psychology Study, is an analysis of the results of "psychological questionnaires [that] were administered to 501 participants in a cigarette taste study conducted at Roosevelt Field Shopping Center. The questionnaires included the extroversion part (24 questions) from the Eysenck personality inventory and Test 3 – Why Do You Smoke? (15 questions) from the Smoker's Self-Testing Kit (PHS Publ. No. 1904, rev. 1969)." Likewise, U.S. Exhibit 53869, the Brown & Williamson document discussed above and U.S. Exhibit* 20848, a 1987 report prepared by The Creative Research Group Limited for RJR Macdonald Inc., entitled Youth Target (interpreting results of over 1200 completed interviews in what was described as "the first of a planned series of research studies into the lifestyles and value systems of young men and women in the 15-24 age range" (U.S. Exhibit* 20848 at Bates

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512679734)) are other examples of the tobacco industry's use of surveys utilized to understand consumer needs and motivations.

Q: Can you describe what you believe were the objectives of this research.

A: Yes, the research was designed to measure smoking behavior, people's attention to advertising materials, and their attitudes and emotional responses toward smoking or its promotion. In fact, some of the documents refer to these studies as "smoker psychology research." J.E. Exhibit 26080, a report by Dr. H. Wakeham and presented to the Philip Morris Board of Directors, dated November 26, 1969, entitled, Smoker Psychology Research, describes a program of psychological research that aims "[t]o learn more about the psychology of smoking, and hopefully to discover ways to exploit the benefits of smoking to the advantage and profitability of our major company business." (J.E. Exhibit 26080 at 3). Among the questions that Philip Morris sought to answer through its smoker psychology work was:

- "Why do 70 million Americans and countless millions outside of the United States smoke despite parental admonition, doctors' warnings, governmental taxes, and health agency propaganda?"
- "What benefits do smokers wittingly or unwittingly find in smoking that outweigh the real or imaginary risks that the same smokers feel?"
- "Why do some people not smoke, others smoke relatively few cigarettes, still others many, some merely puff superficially, while others inhale deeply?"
- "Why do some people start very young, while others wait until middle life to begin smoking?"

(J.E. Exhibit 26080 at 2-3). Interestingly, in 1969, Philip Morris was asking some of the same fundamental questions about smoker psychology that researchers, myself included, have sought to answer much more recently.

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Similarly, U.S. Exhibit 34336, the Lorillard document titled "Overview of Smoker Psychology Studies," noted that smoker psychology research might ". . . offer some direction for creative exploitation in promoting products." (U.S. Exhibit 34336 at 1). The report recommended "continuing the search for actionable clues to meaningful differences in psychological factors relating smokers and brands of cigarettes[,]" and indicated that "[a]n initial review of existing psychological instruments suggests that the Comrey Personality Scales may be worth exploring further." (U.S. Exhibit 34336 at 8).

Q: How did your review of the Defendants' documents inform your view on the way this research was used by the industry?

A: The documents show that cigarette marketers began to assess motivational factors by means of a variety of techniques designed to uncover consumers' actual and desired images of cigarette products. The focus of many of the internal documents was the images associated with advertising themes and brands, often with regard to young people.

Q: What kind of techniques did Defendants use to study imagery?

A: Among others, sophisticated techniques such as word associations and the repertory grid technique were used.

Q: What is the repertory grid technique?

A: It is a process designed to get people to reveal their thoughts. For example, the subject is told, "Here are three brands. Which two are most alike? Why? Which two are least alike? Why?"

Q: What are word associations and how were they used?

A: Word associations (e.g., "What comes to mind when you hear the word Marlboro?") are

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one of the most revealing ways to discover a person's thoughts and images. The study of associations has a long history in psychology, going back to Freud and other early psychologists. Word-association techniques are easy and efficient ways of determining the contents and representational systems of human minds without requiring those contents to be expressed in the full discursive structure of human language. In fact, we may reveal ourselves in associations in ways we might find difficult to do if we were required to spell out the full propositions behind these associations through answers to questions. The tobacco industry has relied upon word-association studies to guide its advertising and marketing efforts. For example, U.S. Exhibit 34334 is a report on a study, dated, September/October, 1975, entitled An Exploratory Study – Smokers' Associations/Interpretations of Specific Words and Phrases used in Kent Advertising Headlines, conducted for Lorillard by Shoi Balaban Dickinson Research, Inc. One of the words from an advertisement that was evaluated was "C'mon," which was described as smooth, soft-sounding, coaxing, and friendly in contrast to "come on" which seemed irritating and demanding.

Q: What are some examples of how the industry utilized imagery, as it relates to your conclusions in this case?

A: U.S. Exhibit 21598, a July 3, 1974 memorandum written by D.W. Tredennick of R.J. Reynolds's Marketing Research Department, is an example of a tobacco company studying imagery associated with its brands in an effort to determine why young people initially choose a particular brand of cigarette. Mr. Tredennick noted that, "[t]he more closely a brand meets the psychological "support" needs (advertising or otherwise

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communicated brand or user image) and the physiological needs (product characteristics), the more likely it is that a given brand will be selected." Among others, he noted that of the "specific causes" for selecting a first usual brand was, "[t]he user 'image' that has become associated with a particular brand. To some extent young smokers 'wear' their cigarette and it becomes an important part of the 'I' they wish to be, along with their clothing and the way they style their hair." (U.S. Exhibit 21598 at 5).

The industry used imagery to create positive affect (or positive feelings) about their respective brands. In U.S. Exhibit 21877, a report entitled Viceroy Agency Orientation Outline, Brown and Williamson, in discussing various campaigns in test market, noted that, "[g]iven consumer awareness of the smoking and health issue, full flavor smokers must deal with their illogical behavior. Therefore, we attempted to communicate VICEROY's flavor/satisfaction benefits by providing consumers a rationalization for smoking or a repression of the health concern." (U.S. Exhibit 21877 at 15). One of the campaigns tested was "Feels Good: 'If it feels good, do it. If it feels good, smoke it. VICEROY. It feels good.'" (U.S. Exhibit 21877 at 15).

Similarly, U.S. Exhibit 45353 is a 1999 Philip Morris marketing report. In a section entitled "Understanding Brand Equity," the report defines brand image as "a stable organization of ideas, feelings, perceptions and associations held by consumers in regard to a specific brand" and "once established, lends consistency and predictability in the consumer's relationship with the brand." The report goes on to explain that, "[a] brand's image and emotions it evokes plays a major role in how consumers will perceive and respond to a brand." (U.S. Exhibit 45353 at 7). Thereafter, the report has an

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extensive discussion of the Marlboro brand image and explains that, with respect to the Marlboro Brand Essence, "Marlboro is the largest selling, best quality cigarette in the world. It is the most flavorful, masculine brand available. But more importantly, Marlboro represents the myth of the American frontier. As such, it taps into the enduring values that are the underpinnings of the American West." (U.S. Exhibit 45353 at 16-22).

The importance of imagery is also apparent in U.S. Exhibit 22055, which is a report entitled "A Qualitative Assessment of Camel Advertising Equity," prepared by Ellison Qualitative Research, Inc. for R.J. Reynolds Tobacco Company, dated October, 1991. In the Management Summary, it is noted that, "[i]nsofar as what in CAMEL advertising is engendering positive feelings and which are key factors to incorporate into future advertising to at least maintain, but ideally, to strengthen such equity, the following seem to be the most prevalent variables. . . [list of factors discussed]." (U.S. Exhibit 22055 at Bates 507642901). The report further indicates, in discussing focus group results, that "[s]ome – in both CAMEL and MARLBORO groups; in both female and male groups – volunteered that the CAMEL advertising is 'probably' a factor contributing to their positive feelings for/personal comfort level with the CAMEL Brand." (U.S. Exhibit 22055 at Bates 507642906). Similarly, U.S. Exhibit* 20459, a report drafted by Bruce Eckman, Inc. for Philip Morris, entitled The Viability of the Marlboro Man Among the 18-24 Segment, dated, March, 1992, discusses an array of imagery associated with both the Marlboro brand and the Camel brand, commenting that, "The cowboy as a symbol. . . works off of deep emotional connections." (U.S. Exhibit* 20459 at bates 2045060184).

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U.S Exhibit 53869, a Brown & Williamson document discussed above, emphasizes the importance of imagery in creating positive affect. It states that, "[t]o us, the importance of a brand's image is paramount. Focus group work conducted by PKG in 1975 helps to put this in perspective from the smoker's standpoint: 'In addition to the taste and "feeling" of smoking, imagery is an important aspect of brand preference.'" (U.S. Exhibit 53869 at Bates 670625232). The report continues that additional focus group work has showed that "[p]erhaps the most outstanding finding of these most recent group discussions on cigarette products involves the importance of the visual elements of a cigarette advertisement. It is absolutely critical that the headline and visual elements of a creative execution be capable of communicating the full impact of the ad's message. Smokers readily admit a very strong degree of loyalty to their cigarette brands; consequently, their attention to cigarette ads, not to mention ad readership, is at very low levels. The visual portion of a cigarette ad, then, must not only attract the readers' attention but it also must be able to communicate the product story and imagery as if the body copy were not there." (U.S. Exhibit 53869 at Bates 670625232). See also, the Lorillard study analyzed in U.S. Exhibit 55999, a research report entitled, An Exploratory Study for Newport, Smoking and Purchase Behavior of Young Adults, conducted for Lorillard by Shoi Balaban Dickinson Research, Inc., dated October, 1981, that found that "[b]oth unaided and aided recall of cigarette advertising demonstrates these young smokers focus almost entirely on the visual aspects of advertising rather than copy content." (U.S. Exhibit 55999 at 6 (emphasis in original)).

It is obvious from a number of tobacco company documents that it was deemed

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important to develop positive brand imagery. *See, e.g.*, U.S. Exhibit 67796 (November 5, 1999 research report prepared for Brown & Williamson Tobacco, entitled "Pall Mall Positioning Research Presentation of Findings"); U.S. Exhibit 41933 (April 25, 1995 Philip Morris USA memorandum from Bob Mikulay to Natalie Ellis regarding "Player's Navy Cut Retail Research Summary and Expansion Plan Highlights"); U.S. Exhibit* 39363 (May, 1998 Executive Summary, entitled "A Qualitative Focus on New Product Development for Marlboro: Marlboro Milds," conducted exclusively for Philip Morris, New York, NY, by Sun Research Corporation); and U.S. Exhibit 43343 (a post-1996 Philip Morris document, entitled "Parliament Blue Image Study Research Proposal").

Q: From your review of the documents, did you find that the use of imagery in marketing by the Defendants was limited to print advertising?

A: No. A seemingly successful strategy employed by several companies was to sponsor car racing. A 1998 Brown & Williamson document, entitled KOOL: TRADEMARK AND INDY CAR SPONSORSHIP, U.S. Exhibit 35020, notes that, in discussing the effort to re-position Kool's trademark image, "Indy Car racing has been isolated as a sponsorship vehicle for KOOL due, in large part, to the positive imagery reinforcements it provides to the trademark in deficient areas. Specifically, car racing in general and open wheel racing in particular are associated with imagery attributes of masculinity, modernity, popularity and quality. This is based on quantitative research conducted in Canada and qualitative research undertaken in the U.S." (U.S. Exhibit 35020 at 1). The document continues, in a section entitled "Results: Imagery and Awareness," to explain that, "[f]urther reinforcing the importance of this activity is the direct imagery benefit the

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trademark enjoys among those aware of the sponsorship activity. Two studies were conducted in 1997, which examined the image of KOOL among smokers aware of the sponsorship versus those who were not. Smokers 21-30, as well as the KOOL franchise smokers who were aware of the sponsorship involvement had more positive impressions of KOOL on important imagery dimensions. These are all imagery attributes, which have been targeted for improvement via the re-positioning effort." (U.S. Exhibit 35020 at 2).

Likewise, U.S. Exhibit 70273, a Philip Morris document, recognizes, with respect to "Marlboro Racing," "• Extend Marlboro's imagery in a relevant venue; •Reflect Marlboro's core values of masculinity, freedom, and independence; •Indy Racing is larger than life. . . Only Marlboro can do it." (U.S. Exhibit 70273 at Bates 206369500).

Q: Did you see any other similarities between aspects of Defendants' documents and the conclusions you have drawn in this case?

A: Yes. In reaching my ultimate conclusions, I rely on the premise that when starting to smoke, young people engage in experiential thinking, as opposed to rational or analytic thinking. I recognized that theme throughout the industry documents that I reviewed. Reliance on imagery and the feelings (e.g., affect, emotion) linked to images is a fundamental component of experiential thinking.

Q: Can you provide examples where the Defendants in their documents stress the importance of feelings and emotion over reason?

A: Yes. In discussing the framework for a study, it is explained in U.S. Exhibit 20716, an R.J. Reynolds memo, the subject of which is, Thoughts on Younger Adult Smoker Study,

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dated July 16, 1984, that various 'rules of thumb' for developing effective younger adult smoker marketing programs have been suggested, including, "use of a 'soft sell.' Use humor. **Stress emotion not reason**." (U.S. Exhibit 20716 at 2 (emphasis added)).

Likewise, U.S. Exhibit 20764, an R.J. Reynolds document, entitled Camel Advertising Development "White Paper," in discussing guidelines for Camel's advertising development to achieve its desired positioning among younger adult smokers, explicitly states that, "[s]ince CAMEL does not have a demonstrably different or unique product (rational) benefit to sell, this jolt needs to be based on an emotional response and is unlikely to be accomplished with advertising which looks conventional or traditional." (U.S. Exhibit 20764 at 7).

U.S. Exhibit 66465, a March, 1988 RJR report, entitled "'Heroic Camel' Advertising Test," noted that among four stated advertising objectives, one was to "elicit[] positive emotional response." (U.S. Exhibit 66465 at Bates 506870430). The report continues that among the objectives of the research described in the report was "to assess the emotional response generated by the advertising among target and franchise smokers." (U.S. Exhibit 66465 at Bates 508670432).

Furthermore, U.S. Exhibit 67536, a December, 1978 report prepared for Lorillard by Unisearch, entitled "A Qualitative Investigation of Old Gold Filters," in discussing brand selection of 10-14 year olds and 14-17 year olds, comments that "Smoking doesn't seem to need all that great a rationale: youth immortal. Contrast with previous - older groups." (U.S. Exhibit 67536 at Bates 85073125).

Q: What significance do you attribute to the existence of this theme in Defendants'

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documents?

A: I have concluded that because individuals, particularly young people, rely heavily on experiential thinking in starting to smoke; they focus more on imagery and feelings than on an analytic determination of the risk associated with smoking. As such, the positive feelings engendered by the carefully designed imagery motivate the desire to smoke and, simultaneously, depress the sense of risk (recall the affect heuristic).

U.S. Exhibit 21475, an R.J. Reynolds research planning memorandum, entitled Some Thoughts About New Brands of Cigarettes for the Youth Market, dated February 2, 1973, notes that:

> A final psychological factor which also did not fall readily into Table I involves smoking-health attitudes. The smoking-health controversy does not appear important to the group because, psychologically, at eighteen, one is immortal. Further, if the desire to be daring is part of the motivation to start smoking, the alleged risk of smoking may actually make smoking attractive. Finally, if the "older" establishment is preaching against smoking, the anti-establishment sentiment discussed above would cause the young to want to be defiant and smoke. Thus, a new brand aimed at the young group should not in any way be promoted as a 'health' brand, and perhaps should carry some implied risk. In this sense the warning label on the package may be a plus."

(U.S. Exhibit 21475 at 8).

Q: Did you find other examples of consistency between your research and conclusions explained in Defendants' documents?

A: Yes. For example, U.S. Exhibit 68113, an untitled R.J. Reynolds document sent from William Bultman outlined a program of research to guide new advertising campaigns for Winston and Camel. Consistent with current academic research on the affect heuristic, this early document presented a new model in which feelings come first and consumers

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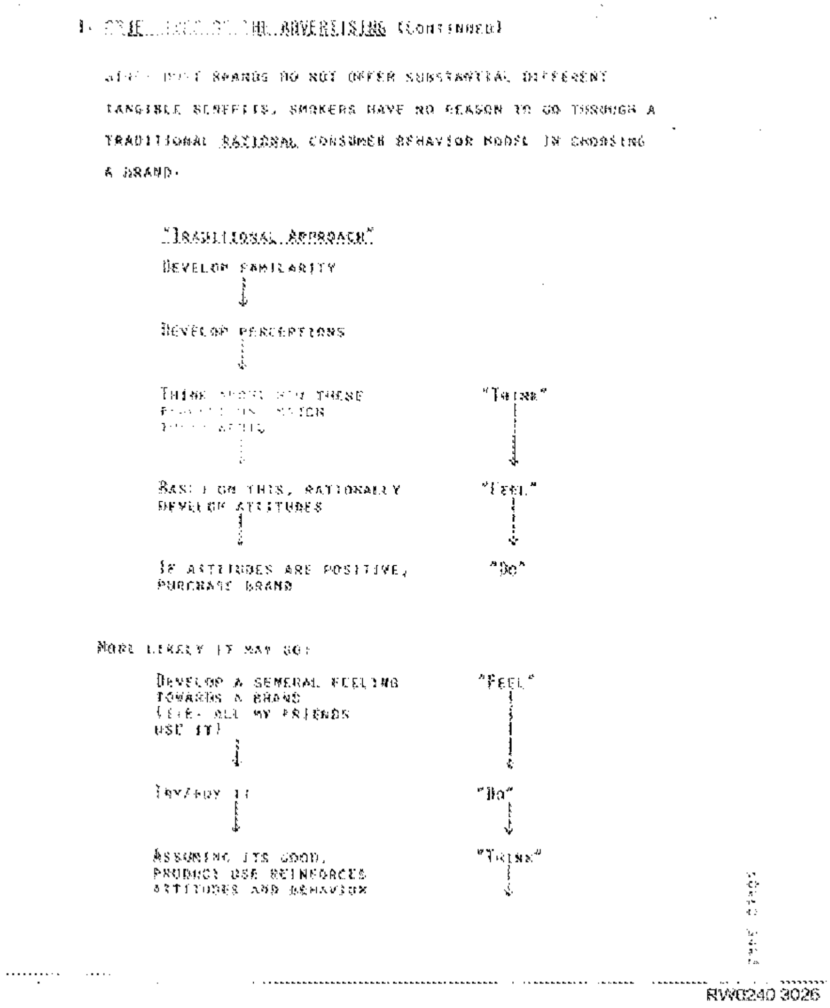
do not go through a traditional rational process of choosing a brand (see Figure O).

Figure O



I. [illegible] ADVERTISING (CONTINUED)

[illegible] BRANDS DO NOT OFFER SUBSTANTIAL DIFFERENT TANGIBLE BENEFITS, SMOKERS HAVE NO REASON TO GO THROUGH A TRADITIONAL RATIONAL CONSUMER BEHAVIOR MODEL IN CHOOSING A BRAND.

"TRADITIONAL APPROACH"

DEVELOP FAMILARITY
↓
DEVELOP PERCEPTIONS
↓
THINK [illegible] THESE [illegible] — "THINK"
↓
BASED ON THIS, RATIONALLY DEVELOP ATTITUDES — "FEEL"
↓
IF ATTITUDES ARE POSITIVE, PURCHASE BRAND — "DO"

MORE LIKELY IT MAY GO:

DEVELOP A GENERAL FEELING TOWARDS A BRAND (I.E. ALL MY FRIENDS USE IT) — "FEEL"
↓
TRY/BUY IT — "DO"
↓
ASSUMING ITS GOOD, PRODUCT USE REINFORCES ATTITUDES AND BEHAVIOR — "THINK"

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Parliament was selected as brand PXB and the following year, in August, 1999, according to U.S. Exhibit 70717, a document titled "Life after Launch," prepared for Philip Morris by the firm Young and Rubicam, outlined strategies for promoting the Parliament brand. A theoretical model was outlined to guide the effort, once again reflecting the knowledge that "The essence of smoking" proceeded from the rational level (taste) to the experiential level (social facilitation) and ultimately to the emotional level

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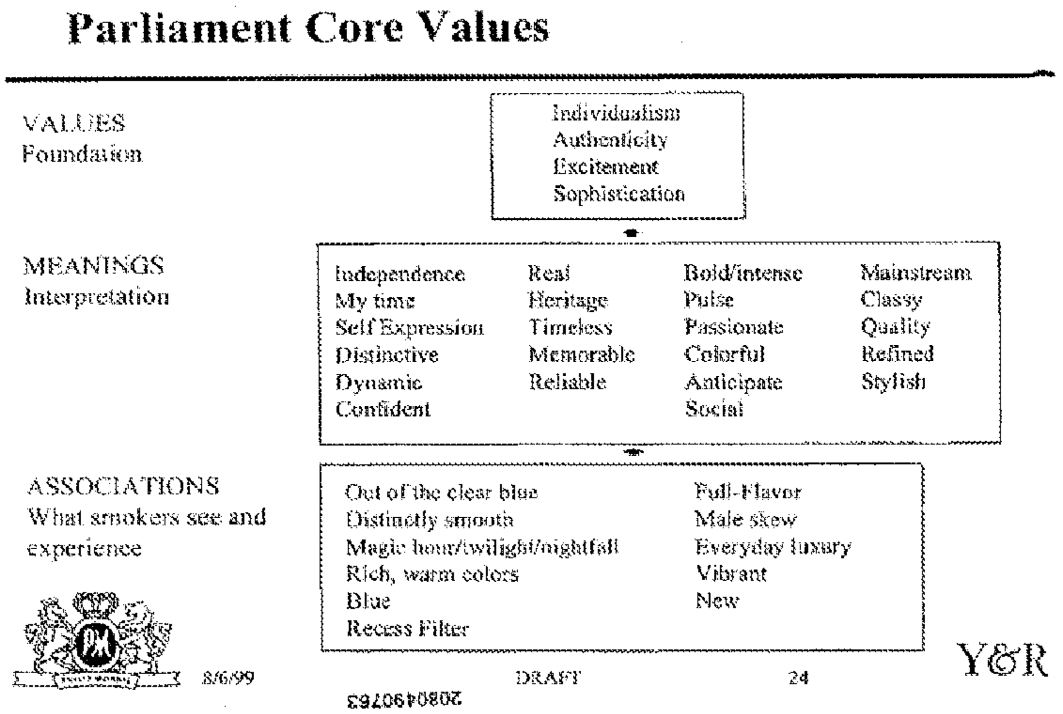
(escape, adventure, independence, personal expression, edgy, exciting). If communication is based on the emotional link, the document advises, it can "last forever (e.g., Marlboro)." Survey research identified a remarkable array of core values to aim at establishing in a "photo shoot" by means of varying time of day, skies, people, location, vistas, and colors (see Figure Q).

Figure Q.



Finally, consistent with my findings, a study reported in a tobacco industry document indicates smokers' widespread dissatisfaction with their smoking. According to U.S. Exhibit 21460, in which much of the data came from Roper Reports, a study conducted in 1984 for Philip Morris found that 85% of smokers agreed with the statement: "I wish I had never begun smoking." Over 80% claimed to have attempted to quit smoking.

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Q: Thank you, Dr. Slovic.

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